

## IN THE ABSTRACT

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## **ABSTRACT**

The present invention is directed to the creation of optical waveguiding devices from standard optical fibers by the creation of zones of permanently altered refractive index characteristics therein. A high intensity femtosecond laser beam is focused at a predetermined target region in the fiber so as to soften the glass material at the target region. After aligning the focal region with the target region in the fiber there will be relative movement between the focal region and the fiber, which has the effect of sweeping the focal region across the fiber in a predetermined path. The result is a zone within the fiber in which the refractive index characteristics of the fiber have been permanently altered so as to control amplitude, phase, spatial propagation or polarization states of light within the material.